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with the barbs removed. After the hooks have been attached to the animal the chains are drawn into the slots of the cleats where they are held firmly.

University of Utah. NEWTON MILLER.

MECHANISM OF MENDELIAN HERIDITY

In a book bearing this title T. H. Morgan and co-workers have undertaken to bring to the general biologist the significant steps that have been made by the geneticists in the study of inheritance, and the correlation of these results with the discoveries made by the students of the minute structure of the germ cells. It is perfectly apparent that these cells, the egg and the sperm, must contain the mechanism by which hereditary qualities are handled from generation to generation. It is manifest that the wonderful results which the Mendelians have been able to get by breeding experiments will be explained, if ever, only through the study of the minute units of cytoptasmic and nuclear structure, which must be their material basis.

As is well known the author strongly supports the view that the chromosomes are the particular part of the protoplasm which determines such hereditary phenomena as follow the Mendelian principles. No cytological work has done more to discover the facts which tend to support this view than the brilliant investigations of Professors Wilson and Morgan and their students in Columbia University.

This book brings together the wonderful series of parallels between the observed conditions of the chromosomes and the statistical behavior of unit characters in breeding, which we describe collectively as Mendelian. For example, the observed segregation of chromosomes in the genesis of the germ cells coincides remarkably with the theoretical demands of the Mendelian principles of segregation resulting in the "purity of the gametes." Similarly there has been established in some organisms a parallelism between the number of chromosomes and the number of hereditary *groups* of characters; also in some degree between the size of the chromosomes and the size of these groups of characters.

A more difficult task outlined and undertaken in this book is to show that there are parallels in the behavior of the chromosomes to those more complex dissolving of groups of characters which allows more or less freedom (and more or less linkage) of one unit quality to other unit qualities. If chromosomes carry the unit characters it is clear that each chromosome must carry factors relating to numerous unit characters, since there are many more characters than chromosomes. From the way that different unit characters behave from generation to generation, it is clear also that there must be machinery for the separation and crossing over of the factors of the unit characters from one chromosome to another in differing degrees. The authors find this possibility in the twisting, the partial unions, and the separation along new lines that occur in the period of conjugation of the chromosomes in the maturation of gametes.

Brief statements are made of other offered explanations of the Mendelian phenomena of inheritance.

The discussion is given under the following Chapter headings: Mendelian Segregation and the Chromosomes; Types of Mendelian Heredity; Linkage; Sex Inheritance; Chromosomes as Bearers of Hereditary Material; Correspondence between the Distribution of the Chromosomes and of the Genetic Factors; Multiple Allelomorphism; Multiple Factors; The Factorial Hypothesis. The Appendix contains directions for the breeding of *Drosophila,* the fruit fly on which much of the investigation of Mendelian phenomena in animals has been made; a Bibliography; and an index. Mechanically the book meets every expectation.

Mechanism of Mendelian Heredity, by Morgan, Sturtevant, Muller, and Bridges. 262 pages, 64 illustrations. Henry Holt & Co., New York, 1915. Price $3.00.